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HFK:pdw

November 23, 1954

/ SUGGESTED PROCEDURES FOR HOT DIPPING

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C-59422

Recently a representative of your office visited the Reservation to discuss the packaging program and indicated that he wished to investigate the feasibility of protecting certain items with a plastic coating similar to that marketed as "Peel Seal" in both the bare and unit pack condition. Immediately after being subjected to the hot dip, the items are to be tested for functioning. In addition, the units are to be tested for functioning after undergoing engineering tests and after being subjected to long term storage at various conditions. Also, where possible, the items are to be allowed to come to the temperature conditions of the bath to ascertain what effect this would have on them. It was agreed that we would submit to your office a test agenda for each item with a cost estimate for the program. Attached please find suggested test programs for the items to be tested.

To complete the program including fee and administrative costs, it is believed that no more than \$4,000 would be required. At the completion of any one phase of the program, letter reports would be submitted to your office. At the completion of an entire program, a formal report would be submitted. If, however, it appears that compilation of a final report would require two weeks or less, the letter report would be delayed to accomplish this. Naturally, if anything of a critical nature should arise during the test, it will be transmitted to you immediately.

If any of the above does not meet with your approval, please notify us at your earliest possible convenience.

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Very truly yours,

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Attachment

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cc: H. M. Anderson

## MEMORANDUM

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To: Luther Arnstin (2)  
 E. L. Kreidl (1)  
 H. M. Anderson (1)  
 File (1)

Case: 59422 Date: November 23, 1954 Page: 1

Subject: Suggested Procedures for Hot Dipping.

Outlined below please find suggested procedures for hot dipping and subsequent testing of various items. These are based on experience gained here during the past involving similar operations with rockets, C-4, and various types of ammunition. It has been suggested that each item be treated not only in the unit pack but in the unwrapped state. Naturally, some units due to their inherent properties do not lend themselves to this approach and for that reason it will be noted that several units are suggested for testing in the wrapped condition only. From a practical standpoint it is felt that consideration should not be given to the storage of single units after coating since it would be far less expensive to dip unit packs for storage. However, for information as to the functioning of the unit when subjected to those conditions, tests are suggested where they apply. The advisability of allowing all units to remain in the bath until they come to temperature conditions (325 to 350 F) is questioned depending upon the item. As an example - if an explosive item were subjected to these conditions, there is a possibility that a detonation might occur thereby destroying the apparatus and endangering personnel. In cases where there is no danger of detonation, this procedure can be adopted if it is deemed that valuable information will be obtained.

After dipping, the units should be tested for functioning, subjected to climatic tests followed by functional testing, and tested after a long period of storage. These procedures are taken up more fully below:

(1) RR Torpedo. It is suggested that the RR torpedo be dipped in the unit pack only since if dipped in the unwrapped condition great difficulty would be encountered in freeing the unit of the plastic material. Five units should be placed in the present chipboard box, the box being placed in a metal foil bag and the bag being evacuated and sealed. Several such packs should then be subjected to a double dip in the plastic material. They should be tested for functioning immediately after dipping, after accelerated aging, and after igloo storage. The criterion for satisfactory functioning would be the successful detonation of a Corps of Engineers special non-electric detonator when a ten-pound weight was allowed to fall on the dome through a distance of 30". At least five successive samples should satisfactorily complete the test before it was deemed satisfactory.

From H. F. Knight

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Arthur H. Little, Inc.

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why?  
 (2) C-3 and C-4. Due to the chemical composition of C-3 and C-4, no attempt should be made to hot dip the material as such. Prior to any dipping it should be wrapped in kitchen-type waxed paper over-wrapped with grease-proof crepe paper and inserted in a metal foil bag. The bag after evacuation and heat sealing would receive a preliminary dip resulting in a thin coating followed by a second dip, care being taken that no air pockets resulted from either operation. The material should then be subjected to visual inspection, plasticity, and tested for high order detonation with one Corps of Engineers special electric detonator immediately after dipping.

(3) Prima Cord. This material should be dipped in the unwrapped condition to determine if the plastic would damage the cord. It should be visually inspected and tested for high order detonation with one Corps of Engineers special detonator immediately after dipping. The criterion for high order detonation would be the successful firing of five or more successive lengths with one Corps of Engineers special detonator. If after this procedure any obvious damage occurred to the material or if it failed to function satisfactorily, it should be packaged in a metal foil bag and the procedure repeated.

(4) Time Fuse. In a similar manner as with the prima cord, the time fuse should be dipped in the unwrapped condition and tested for satisfactory functioning immediately after dipping, after accelerated aging, and after igloo storage. The criterion for satisfactory functioning would be the successful ignition and burning of the time fuse when fitted with a standard untreated fuse lighter. At least five successive samples should ignite and burn before the functioning would be deemed satisfactory. If any obvious damage occurred or if the material failed, it should be placed in a metal foil bag, the bag being evacuated and sealed and the tests repeated.

(5) Fuse Lighters. The fuse lighters should not be dipped in the unwrapped condition but should be placed in a metal foil bag, the bag evacuated and sealed followed by two dips in the plastic material. The items should be tested for functioning immediately after dipping, after accelerated aging, and after igloo storage. The criterion of satisfactory functioning would be the successful ignition by the fuse lighters of five or more pieces of untreated time fuses.

(6) Pocket Incendiary. Since the unit pack of the pocket incendiary consists of two units sealed in a metal can, it is felt that no test need be run on the unit itself or on the unit pack. However, if information as to the functioning of the time pencil after such a procedure is required, these units could be tested as a separate items. Prior to dipping, the pencils should be

lets look into sealable foil without cloth back.

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wrapped with tape in such a manner so as to prevent the plastic material from entering the view ports and through the recesses required by the safety pin. After dipping, the items should be tested for functioning immediately after the dipping. Satisfactory functioning would involve the successful ignition of the match head by the firing pin after the ampoule was crushed in five successive attempts. If malfunctioning occurred, the pencil could be further protected by including it in a plastic or metal foil bag and the tests repeated.

*OK*  
*57000*  
*leave out*  
*O-unit*  
(7) Thermit Well. This unit should not be dipped in the unwrapped condition since the intimate contact of the wax with the plastic would strip the protective coating from the unit. The item should be placed in a metal foil bag, the bag evacuated and sealed. After double dipping the unit should be tested for functioning immediately following the dip, after accelerated aging. The criterion for successful functioning would be the ability of the unit to penetrate 3/4" of mild steel five successive times when activated by the fuse lighters.

*P-unit*  
(8) Head Delay Incendiary. This unit could be dipped in the unwrapped condition and tested immediately after dipping, after accelerated aging. Satisfactory functioning would entail the successful ignition of five successive units when fitted with A. C. Delays. If any malfunctioning occurred or if any damage was noted from the dip, it should be packaged in metal foil bags and the procedure repeated.

*lets leave out*  
(9) Small Arms Ammunition and Rocket Incendiary Adapter. More information regarding the unit pack is required for these two items before any test procedure can be suggested.

HFK/mac

By:



*They have 2.36 & 3.5 in  
191005*

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*Let's add fused matched-box  
Time pencils - boxed  
A.C. Delay. w/ M39*

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